

B(4)

B(4), LTD.

US version

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June 13, 2017

SDS: B(4) (C)

## SAFETY DATA SHEET

B(4)

### 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: B(4)

RECOMMEND USE: B(4)

MSDS PREPARED BY: EHS Division, B(4)

#### JAPAN

SUPPLIER: B(4), LTD.

SECTION: EHS Division

ADDRESS: 150 Nakamaruko, Nakahara-ku, Kawasaki City, Kanagawa Prefecture 211-0012, JAPAN

TELEPHONE NUMBER: +81-44-435-3000

FAX NUMBER: +81-44-435-3020

EMERGENCY RESPONSE: +81-44-435-3001  
+81-44-435-3002

#### USA

SUPPLIER: B(4) AMERICA, INC.

ADDRESS: 4600 N.E. Brookwood Parkway, Hillsboro Oregon 97124, U.S.A.

TELEPHONE NUMBER: +1-503-693-7711

FAX NUMBER: +1-503-693-2070

EMERGENCY RESPONSE: +1-800-424-9300 (CHEMTREC for U.S.A.)  
+1-703-527-3887 (CHEMTREC for international)

### 2. HAZARDS IDENTIFICATION

#### **Emergency Overview:**

GHS CATEGORY	Category
Flammable liquids	No Classification
Acute toxicity (oral)	Category 3
Acute toxicity (dermal)	Category 3
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ systemic toxicity following single exposure	Category 1
Specific target organ systemic toxicity following single exposure	Category 2
Specific target organ systemic toxicity following repeated exposure	Category 1

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## GHS LABEL ELEMENTS

Precautionary pictograms:



Signal word: Danger

Hazard Statement:

H301 Toxic if swallowed

H311 Toxic in contact with skin

H315 Causes skin irritation

H318 Causes serious eye damage

H370 Causes damage to organs (nervous system)

H371 May cause damage to organs (central nerve system)

H372 Causes damage to organs (nervous system),  
through prolonged or repeated exposure

Precautionary Statements:

Prevention P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. continue rinsing.

P309+P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

P310 Immediately call a POISON CENTER or doctor/physician.

P314 Get Medical advice/attention if you feel unwell.

P330 Rinse mouth.

P332+P313 If skin irritation occurs : Get medical advice/attention.

P361 Remove/Take off immediately all contaminated clothing.

P362 Take off contaminated clothing and wash before reuse.

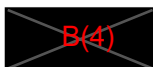
P363 Wash contaminated clothing before reuse.

Storage P405 Store locked up.

Disposal P501 Dispose of contents/container in accordance with all national and local regulations.

## OSHA Regulatory State:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.



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#### Potential health effects:

Prolonged skin contact causes damage on the dermal tissue, for it contains basic substance.

Eye contact causes irritation. It also may cause burnt, damage on eyesight, or loss of eyesight.

Inhalation irritates trachea, lung, throat, or nose.

Irritating to mouth, throat, and stomach and may cause severe and permanent damage.

#### Potential environmental effects:

See Section 12: ECOLOGICAL INFORMATION

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

SUBSTANCE/MIXTURE: Mixture

CHEMICAL NAME (GENERIC NAME): ----

SYNONYM (S): ----

INGREDIENT AND COMPOSITION:

INGREDIENTS	wt%	CHEMICAL FORMULA	CAS NO.
Dimethylsulfoxide	55~65	(CH <sub>3</sub> ) <sub>2</sub> SO	67-68-5
Glycol ether	20~30	Trade Secret	Trade Secret
Glycol	5~15	Trade Secret	Trade Secret
Tetramethyl ammonium hydroxide	1~3	N(CH <sub>3</sub> ) <sub>4</sub> OH	75-59-2

### 4. FIRST AID MEASURES

#### First aid statements

##### First aid for exposure to eyes:

Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

Rinse eye balls and eyelids thoroughly with water.

Check pH of the lacrimal fluid with litmus papers, if possible, and rinse eyes until the pH becomes normal (neutral).

Start rinsing as soon as possible to rinse away the material thoroughly, since delay of start of rinsing or insufficient rinsing of the exposed eyes may result in loss of sight.

Immediately take the patient to a physician for examination and treatment.

##### First aid for exposure to skin:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Rinse off the skin thoroughly and quickly as possible.

Delay of few seconds may increase injury.

##### First aid for inhalation:

Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Loosen clothing and secure a clear respiratory airway.

Cover the body of the victim with blanket or the like to keep him/her warm and quiet.

If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

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Immediately take the patient to a physician for examination and treatment.

**First aid for ingestion:**

Do not induce vomiting.

(The risk increase by vomiting because it is corrosive )

If victim is conscious and alert, give 2-4 cupfuls of milk or water.

Never give anything by mouth to an unconscious person.

Immediately take the patient to a physician for examination and treatment.

**Most important symptoms/effects, acute and delayed:**

Prolonged skin contact causes damage on the dermal tissue, for it contains basic substance.

Eye contact causes irritation. It also may cause burnt, damage on eyesight, or loss of eyesight.

Inhalation irritates trachea, lung, throat, or nose.

Irritating to mouth, throat, and stomach and may cause severe and permanent damage.

**Note to physicians**

See Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

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## 5. FIRE FIGHTING MEASURES

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**Extinguishing media:**

Dry sand, foam, carbon dioxide, or dry chemical powder extinguisher.

**Specific hazards arising from the chemical:**

Hazardous polymerisation does not occur.

It may decompose upon combustion or in high temperatures, forming carbon oxides, sulphur oxides.

**Fire fighting instructions:**

Shut off fuel as much as possible.

Dry chemical or carbon dioxide should be used for small fires.

Evacuate unnecessary personnel to safe area.

Foam should be effective for large fires.

When sprayed, water should be effective for cooling and protection of the fire fighters. However, use of water may expand the fire.

**Protection of firefighters:**

Fire fighters wear proper protective clothing and respiratory protection(SCBA).

Fight fire from protected location or safe distance.

Consider the use of unmanned hose holders or monitor nozzles.

Keep upwind of fire.

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal precautions:**

Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.

Evacuate the leeward personnel.

Ventilate the area.

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Quickly shut off all ignition sources.

Equip extinguishers in case of ignition.

Wear proper protective clothings.

Do not touch any damaged container or spills without wearing appropriate protective equipment.

**Environmental precautions:**

If safety allows, stop flow at the source.

Prevent spilt solution from entering sewers, watercourses, rivers, or fields.

**Methods and materials for containment and cleaning up:**

Avoid routing of material to water bodies or streams.

Avoid discharge to drains and to the environment.

When the leak is small, take up spills into an empty container by adsorbing them to dry soil or sand/paper/clothes and neutralize the residual liquid.

When the leak is large, stop the flow with soil or the like and then, channel the flow to a safe place to take up them as much as possible into an empty container by piping them up or by adsorbing them to dry sand or the like.

Neutralize then the residual liquid with an acid (such as diluted hydrochloric acid or diluted sulfuric acid).

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## 7. HANDLING AND STORAGE

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**Handling:**

Use proper personal protective equipment as indicated in Section 8.

Wear appropriate protective goggles, rubber gloves, protective clothing.

Avoid overflowing, spilling or scattering the material since this is a toxic and corrosive material.

Work from windward.

Evacuate unnecessary personnel to safe area.

Use only in the well-ventilated area.

Do not breathe mist or spray.

Use a local exhaust to avoid inhalation if vapor or aerosol will be generated.

Seal the container after handling.

Shut off all sources of ignition.

Avoid contact with oxidizing agents or reductants.

The electric facility should be explosion proof.

Ground.

When moving the solution through pipings, ground the metallic part of the apparatuses, pipings and containers to prevent generation of electrostatic charges.

Pay attention to ventilation. This vapor is heavier than air, and easily stays at low position.

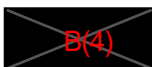
Do not use direct heater or immersion heater for heating, and watch out when fire is used.

Relieve internal pressure before opening the container.

Solution should not remain in pipings when it is not used.

Water facility should be installed at every place where the solution is used.

It should facilitate measures in case of adhesion or contact with eyes.



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Wash hands and face thoroughly after handling.

Install safety shower and eye bath.

Be careful in handling the container, and protect it from damages.

Do not bring contaminated protective tools, such as gloves, to the lounge.

Be careful of personal health after handling.

**Storage:**

Keep the container sealed, and store in a dark place.

Store locked up.

Store in a cool, dry, well-ventilated area away from incompatible substances.

Store away from incompatible materials such as oxidizing agents.

Use containers designated in the United Nations Regulations for Transport of Dangerous Goods.

Do not store or set together with acid, for this is basic.

Keep away all sources of ignition.

Do not overheat.

Do not let it evaporate without a reason.

Store in well-ventilated area.

**OTHERS:**

Follow all national and local regulations.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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**EXPOSURE GUIDELINES:**

INGREDIENTS	ACGIH TLV	OSHA PEL
Dimethylsulfoxide	None established	None established
Glycol ether	10ppm(IFV):Inhalable fraction and vapor	None established
Glycol	None established	None established
Tetramethyl ammonium hydroxide	None established	None established

**Engineering controls:**

When handling, try to use closed apparatuses, equipment or partial ventilator.

**Personal protective equipment (PPE):**

Eye/face protection: Use chemical safety goggles and/or a full face shield where splashing is possible.

Skin protection: Wear appropriate protective clothing to minimize contact with skin. (Impervious protective clothing. Protective boots, Protective apron, etc)

Wear appropriate protective gloves (rubber gloves,alkali resistance)

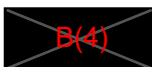
Respiratory protection: Half or full facepiece respirator, self-contained breathing apparatus, supplied air respirator, etc.

Use respirators approved under appropriate government standards and follow local and national regulations.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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Physical State:	Liquid
Color:	Yellowish brown
Odor:	Characteristic odor
Odor threshold:	No data available
pH:	No data available
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	104 °C
Evaporation rate:	No data available
Flammability(solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapour pressure:	No data available
Vapour density:	No data available
Relative density:	1.04 (25 °C)
Solubility:	water: Soluble.
Partition coefficient; n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available

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## 10. STABILITY AND REACTIVITY

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Reactivity:	No dangerous reaction known under conditions of normal use. Absorbs carbon dioxide from the air, and then degradation.
Possibility of hazardous reactions:	Polymerization will not occur.
Chemical stability:	Stable at normal temperatures and pressure.
Conditions to avoid:	Avoid overheat, flames, sparks and other sources of ignition.
Incompatible materials:	Acidic chemicals, oxidizing agents and reductants.
Hazardous decomposition products:	Up on heating (or burning), toxic gasses (w.g., nitrogen oxide, sulfur oxide cyanide) are formed.

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## 11. TOXICOLOGICAL INFORMATION (Only data for each component is available.)

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### Dimethyl sulfoxide

Acute toxicity (oral):	LD50: 17400~28300 mg/kg[rat]
Acute toxicity (dermal):	LD50: 40 g/kg[rat]
Acute toxicity (inhalation):	LD50: > 2.9 g/kg[rat]
Skin corrosion/irritation:	Mild [rabbit]
Serious eye damage/irritation:	Mild [rabbit]
Respiratory sensitization :	No relevant information found.

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Skin sensitization:	No relevant information found.
Germ cell mutagenicity:	Ames Test:Negative,
Carcinogenicity:	
No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.	
Reproductive toxicity:	No relevant information found.
STOST-single exposure:	No relevant information found.
STOST-repeated exposure:	No relevant information found.
Aspiration hazard:	No relevant information found.

#### Glycol ether

Acute toxicity (oral):	LD50: 5080~9600 mg/kg[rat]
Acute toxicity (dermal):	LD50: > 2000 mg/kg[rat]
	LD50: 2764~4120 mg/kg[rabbit]
Acute toxicity (inhalation):	LC50: > 18 ppm[rat]
Skin corrosion/irritation:	Mild [rabbit]
Serious eye damage/irritation:	Severe [rabbit]
Respiratory sensitization :	No relevant information found.
Skin sensitization:	
Did not cause allergic skin reactions when tested in guinea pigs..	
Germ cell mutagenicity:	
In vitro genetic toxicity studies were predominantly negative.	
Animal genetic toxicity studies were negative.	
Carcinogenicity:	
No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.	
Reproductive toxicity:	
In animal studies, did not interfere with reproduction.	
However, body weights of newborn animals were decreased.	
STOST-single exposure:	May cause damage to central nerve system
STOST-repeated exposure:	No relevant information found.
Aspiration hazard:	No relevant information found.

#### Glycol

Acute toxicity (oral):	LD50: 22 g/kg[mouse], LD50: 20 g/kg[rat]
Acute toxicity (dermal):	LD50: 20800 mg/kg[rabbit]
Skin corrosion/irritation:	No relevant information found.
Serious eye damage/irritation:	No relevant information found.
Respiratory sensitization :	No relevant information found.
Skin sensitization:	No relevant information found.
Germ cell mutagenicity:	Ames Test:Negative,
Carcinogenicity:	



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No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.

Reproductive toxicity:	No relevant information found.
STOST-single exposure:	No relevant information found.
STOST-repeated exposure:	No relevant information found.
Aspiration hazard:	No relevant information found.

#### Tetramethyl ammonium hydroxide

Acute toxicity (oral):	LD50: 34~50 mg/kg[rat]
Acute toxicity (dermal):	LD50: 112 mg/kg[rat]
Skin corrosion/irritation:	Corrosive [rabbit] Category 1
Serious eye damage/irritation:	Category 1
Respiratory sensitization :	No relevant information found.
Skin sensitization:	No relevant information found.
Germ cell mutagenicity:	No relevant information found.
Carcinogenicity:	

No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.

Reproductive toxicity:	No relevant information found.
STOST-single exposure:	Category 1 (nervous system)
STOST-repeated exposure:	Category 1 (nervous system)
Aspiration hazard:	No relevant information found.

## 12. ECOLOGICAL INFORMATION (Only data for each component is available.)

### Dimethyl sulfoxide

Ecotoxicity	
Fish acute toxicity:	4 daysLC50: 34 g/L[Pimephales promelas]
Persistence and degradability:	Lower Biodegradable
Bioaccumulative potential:	Not accumulated, Partition coefficient: n-octanol/water:-1.35
Mobility in soil :	No relevant information found.

### Glycol ether

Ecotoxicity	
Fish acute toxicity:	96hrLC50: 1300 mg/L[Lepomis macrochirus]
Daphnia acute toxicity:	48hrEC50: > 100 mg/L[Daphnia magna]
Algae growth inhibition(acute):	96hrEC50: > 100 mg/L[Scenedesmus]
Fish chronic toxicity:	No relevant information found.
Daphnia chronic toxicity:	No relevant information found.
Algae growth inhibition(chronic):	No relevant information found.
Persistence and degradability:	Biodegradable (BOD:92%)
Bioaccumulative potential:	Aqueous solubility =1000000mg/L Partition coefficient: n-octanol/water: 1

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Mobility in soil : No relevant information found.

#### Glycol

##### Ecotoxicity

Fish acute toxicity: No relevant information found.

Persistence and degradability: Readily biodegradable

Bioaccumulative potential: No relevant information found.

Mobility in soil : No relevant information found.

#### Tetramethyl ammonium hydroxide

##### Ecotoxicity

Daphnia acute toxicity: 48hEC50: 3 mg/L[Daphnia magna]

Persistence and degradability: Readily biodegradable

Bioaccumulative potential: No relevant information found.

Mobility in soil : No relevant information found.

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### 13. DISPOSAL CONSIDERATIONS

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RCRA Hazardous waste ID: Not regulated

All excess material must be collected and transferred to a professional waste disposal company for incineration.

Carefully review information in - **7.HANDLING & STORAGE**.

Comply with all national and local regulations.

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### 14. TRANSPORT INFORMATION

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#### **U.S. Department of Transportation (DOT):**

PROPER SHIPPING NAME: Corrosives liquid, n.o.s. (Tetramethyl ammonium hydroxide)

HAZARD CLASS: 8 (Corrosives)

IDENTIFICATION NUMBER: UN1760

PACKING GROUP: III

Keep away from incompatibilities and all sources of ignition.

Follow all national and local regulations.

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### 15. REGULATORY INFORMATION

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#### **<U.S. REGULATION>**

##### **TSCA (Toxic Substances Control Act):**

Each individual component of the subject product is listed on TSCA Inventory of Existing Chemical Substances.

**Section 4:** Not regulated

**Section 5(a)(2) - Chemicals with Significant New Use Rules (SNURs):** Not regulated

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**Section 6 - Restricted Substances:** Not regulated

**Section 8(d) - Health and Safety Reporting:** Not regulated

**Section 12(b) - Export Notification:** Not regulated

**CERCLA(Comprehensive Environmental Response Compensation and Liability Act)**

Hazardous Substances and Reportable Quantities: Not regulated

**SARA Title III (Superfund Amendments and Reauthorization Act):**

302 Extreme Hazardous Substances (EHS) : Not regulated

311/312 Hazard Categories:

Flammable liquids

Acute toxicity (oral)

Acute toxicity (dermal)

Skin corrosion/irritation

Serious eye damage/eye irritation

Specific target organ systemic toxicity following single exposure

Specific target organ systemic toxicity following repeated exposure

313 Toxic Chemical (TC) : Not regulated

**DEA (Drug Enforcement Administration):** Not regulated

**DHS (Department of Homeland Security):** Not regulated

**<STATE REGULATIONS>**

**CALIFORNIA PROPOSITION 65:** Not regulated.

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**16. OTHER INFORMATION**

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**NFPA RATINGS:**

HEALTH=2, FIRE=1, REACTIVITY=0(SCALE 0-4)

**SDS STATUS:**

Revised section 1&15.

**REFERENCE:**

1. HSDB
2. RTECS
3. The Dictionary of Substance and Their Effects (The Royal Society of Chemistry)
4. Safety Data Sheet (of the raw material manufacturer)
5. Poisonous and Deleterious Substances Control Law: Applicable

CREATION DATE: July 31, 2015

REVISION DATE: June 13, 2017

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The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and

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